

II. Work in Progress



Above, Pentagon employees using the Corridor 2 bridge to enter and vacate the building. Below, an aerial view of the Pedestrian Bridges.

SOUTH TERRACE PEDESTRIAN BRIDGES

The South Terrace Pedestrian Bridges Project includes two pedestrian bridges over Rotary Road, renovation of the loading dock, and connection to the second floor of the Pentagon at Corridors 2 and 3. The main purpose of the project is to provide separation of vehicular and pedestrian access while easing traffic congestion along Rotary Road. The bridges also serve to bring all pedestrians into and out of the Pentagon on the second floor, which will be the standard for all Pentagon entrances.

A five-phased construction plan was conceived for the South Terrace. Phases 1-3 included the Corridor 2 bridge and lobby entrance, new dockmaster offices, and the renovation of the eastern half of the existing South Terrace loading dock. Phases 4 and 5 include the bridge at the Corridor 3 building entrance and the bus stop wall connecting the two bridges, which also provides a visual and security barrier to the loading dock operation.

Due to the construction of the new Remote Delivery Facility, only the eastern half of the existing South Loading Dock was renovated. The western half was converted into occupiable tenant space.



After September 11, North Rotary Road, passing under the pedestrian bridges was closed and several lanes of parking spaces were eliminated. Traffic flow and parking returned to normal in February 2002. The cranes from the Phoenix Project can be seen in the background.



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South Terrace Pedestrian Bridges

CHALLENGES

Due to the terrorist attack, Defense Protective Service has been operating under a heightened level of security. As a result, it was decided to indefinitely delay the opening of the Corridor 3 entrance into the Pentagon.

MILESTONES

The first bridge was completed in December 1999. The second bridge, and connecting bus stop wall, was completed in January 2001.

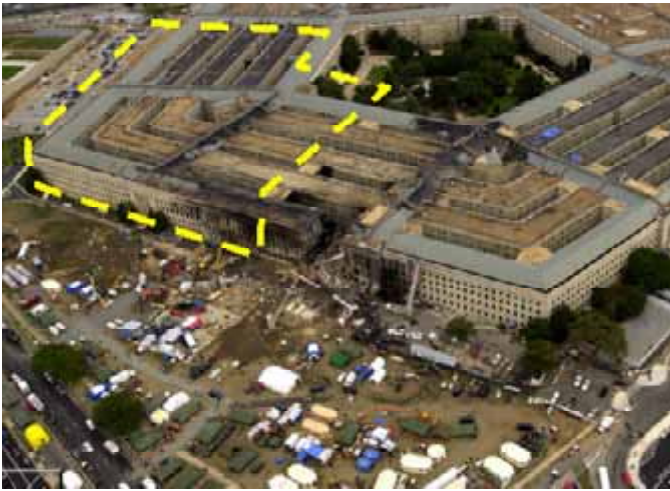
SOUTH TERRACE PEDESTRIAN BRIDGES

- **Awarded "Project of the Year, 2000" by the National Capitol Chapter of the Construction Management Association of America**
- **Moves Pentagon access to the 2nd floor**
- **Elevation of bridges provides safe walkway for pedestrians and easier flow of vehicle traffic.**



The new limestone cladding used on the South Terrace Pedestrian Bridges was mined from the same vein of stone in Indiana used during the Pentagon's original construction in 1941.

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From left to right: The outlined area highlights the one million square feet of Wedge 2 affected by the blast, ensuing fire and inevitable water and smoke damage. Wedge 2 had not yet been renovated and did not have an adequate sprinkler system. The fire in Wedge 2 continued to burn for about two and a half days. Prior to the attack, demolition and abatement work had been scheduled to begin in Wedge 2 in December 2001. The abatement worker is dressed in a protective Tyvek suit and respirator due to the presence of asbestos, lead and mold. The scope of Wedge 2 renovation was cut in half to recover occupiable office space for Pentagon tenants to continue the execution and planning of the war effort. Demolition and abatement work continues in Wedge 2, adjacent to the recovered areas.



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WEDGES 2-5

Wedges 2-5 make up 80 percent of Pentagon building space, approximately 4,500,00 square feet. The project will require relocating 20,000 tenants.

In addition to bringing the Pentagon into compliance with modern building, life safety, ADA and fire codes, the work to be accomplished includes removal of all hazardous materials, new elevators and escalators to improve vertical circulation, security and telecommunications upgrades, and design and installation of state of the art, energy efficient building systems. The project will maximize use of energy saving building materials and recycled products. Renovated spaces will be modern, efficient, and flexible. A key feature of the design is its universal space concept, which allows for great flexibility in reconfiguring spaces as tenants and/or functions change over time.

Following the September 11 attack, Wedge 2 construction was re-phased to allow for rapid re-occupancy of approximately half the wedge to accommodate tenants displaced from the building as a result of the attack. Recovery efforts to allow reoccupancy included utility restoration, construction of new barrier walls, decontamination and recovery of personal effects, remediation of mold, asbestos and lead dust, re-glazing of broken windows, and repair of water and smoke damage.

A view of the fifth floor of Wedge 2, where demolition work is almost complete

WEDGE 2-5 HIGHLIGHTS

- 4,500,000 square feet of building space
- Need to move the 20,000 people who occupy Wedges 2-5
- 5,000 tenants to be coordinated/relocated during each phase
- Communication connectivity required for relocated tenants
- Design-build project delivery method planned
- Implementation of very flexible universal space concept
- Temporary utilities required for each phase to maintain existing building services
- Providing utilities for future occupiable use of Basement/ Mezzanine
- Demolition/abatement removal estimates:
 - 332 million pounds of debris
 - 115 million pounds of hazardous material
 - Goal of 70% material to be recycled
- New building elements:
 - Energy saving building elements/materials
 - Elevators/escalators
 - Automated building control systems
 - Thermal insulated and blast-resistant windows
 - Security upgrades
 - Building code and ADA compliance
- Relocation and build-out of Defense Secretaries/Operation centers
- Relocation and planning for food service and retail building functions
- External historical features preserved



II. Work in Progress**Wedges 2-5**

These photos show Wedge 2 areas on the fourth floor, where demolition has been completed and core and shell work has begun. In the top photo, new windows have been installed. Below, a view of some initial ductwork.

**CHALLENGES**

One of the challenges the team faces is to select building systems and materials with reasonable first costs (construction cost) to stay within budget while attempting to minimize the life-cycle cost of operating the Pentagon in future years. A key schedule risk is performing demolition and construction activities while keeping the building fully operational and working around its 20,000 occupants. Also logistically challenging is the planning and coordination of multiple tenant relocations to populate newly renovated areas. Approximately 5,000 tenants need to be moved during each phase of renovation.

MILESTONES

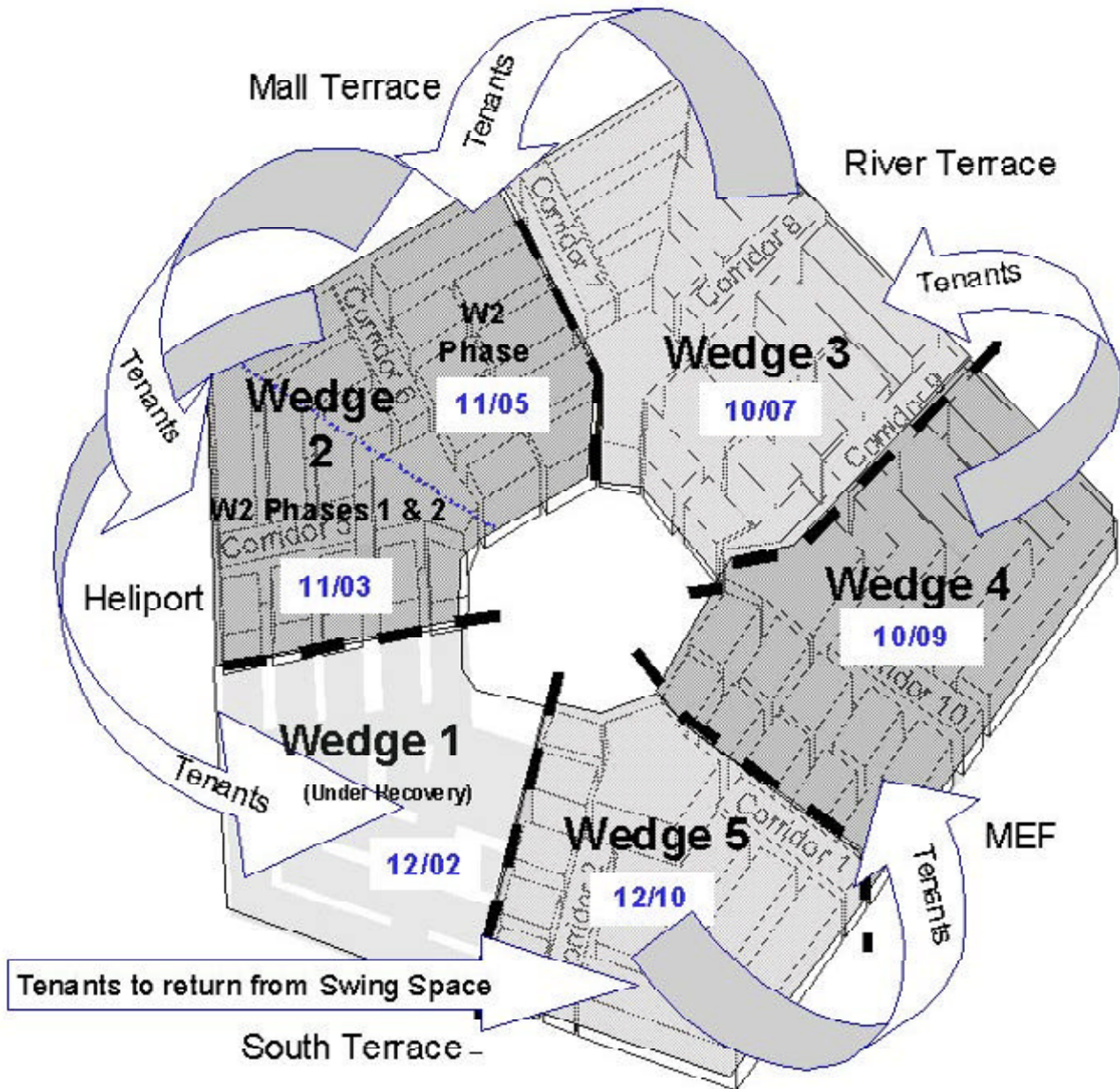
The renovation of Wedges 2-5 will be accomplished in phases, starting with Wedge 2. Renovation of follow-on wedges will proceed as tenants relocate to completed areas. The project, previously scheduled for overall completion in December 2014, has been accelerated to complete 48 months sooner in December 2010.

Recovery of the re-occupancy areas was completed by February 2002. Under the new phasing plan, Wedge 2 will be accomplished in 3 phases, with the first two phases scheduled for completion in October 2003 and the third phase in November 2005.



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Wedges 2-5



The renovation of the Pentagon needed a "jump start" to meet the conflicting demands of keeping tenants operational to continue the war effort while maintaining efforts to meet the advanced completion schedule of 2010. The phasing diagram above indicates that tenants will relocate from the recovered portion of Wedge 2 into Wedge 1 and the first phase of Wedge 2 by November 2003.

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The Pentagon Renovation Program had moved approximately 5,000 tenants into swing space in the Pentagon and leased office space to accommodate the renovation of Wedge 1. In all, approximately one million square feet of swing space was renovated to complete this mission. Due to the terrorist attack, 800,000 square feet of office space was leased by General Services Administration to accommodate the 4,600 people displaced from the Pentagon. The Renovation Program provided logistical support and personnel for this effort.



SWING SPACE

Early in the planning process, it was determined that the most efficient way to renovate the Pentagon while keeping the building operational for its 25,000 tenants was to relocate one-fifth of the building's personnel from their current location in the Pentagon into temporary offices, or swing space, in and around the building. The vacated "wedge" is then demolished and abated of all hazardous materials before being built-out to meet the needs of the tenants in the adjacent wedge, who will move-in upon completion of the space.

Because full connectivity from external swing space to the Pentagon is so critical, three main external swing space buildings have been built-out with classified and unclassified telecommunications backbones, local area networks, telephone lines, and electronic mail. These three buildings feature modern office space with new systems furniture, state-of-the-art voice and data communications systems, and sophisticated security systems. It will be necessary for these swing space buildings to remain occupied by displaced Pentagon employees throughout the entire renovation, however, smaller leased spaces will be vacated and those leases terminated at the completion of Wedge 3. During calendar year 2000, swing space leases and lease delegation authority were transferred from the US Army Corps of Engineers to the Office of the Secretary of Defense, Washington Headquarter Services - Space Policy and Acquisition Division, which now supports the Renovation Program with these activities.

In addition to the previously built-out external swing space, the Renovation Program does not anticipate a need for additional swing space due to the profile of upcoming tenants affected by future wedge construction. As renovation work progresses around the building, the list of essential personnel who must remain inside the Pentagon during renovation is increasing and will peak with Wedges 3 and 5. Everyone who could afford to move out of the building for the duration of the renovation is already located in external swing space.



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Swing Space

During this past year, approximately 120,000 square feet of swing space identified within the Pentagon was occupied by Wedge 2 tenants not slated to move into Wedge 1. Such areas include:

1. Such areas include:
- The former DiLorenzo Clinic (approximately 30,000 square feet)
- A large portion of space vacated as a result of a planned tenant move to Federal Office Building #2 (approximately 65,000 square feet).
- The former Defense Post Office (approximately 12,500 square feet)
- A portion of the public cafeteria located near Corridors 1 and 2 on the Second Floor (approximately 11,000 square feet).

The first swing space move-outs into newly renovated areas of the Pentagon began in early 2001 with a move into the new Remote Delivery Facility, followed by the re-occupancy of Wedge 1.

CHALLENGES

As a result of the September 11 attack and the congressional direction to complete the overall renovation by 2010, the swing space requirements may drastically change.

Further complicating the swing space mission is the need to eliminate the use of the Butler Building due to security reasons. When the last tenants move in the spring of 2002, the Butler Building will be removed from the swing space inventory and will be used for material storage.

4,600 people were displaced from Wedges 1 and 2 as a result of the terrorist attack and there was an immediate need for 800,000 square feet of additional swing space. As part of the emergency response, General Services Administration, in coordination with RE & F took over the coordination of identifying and building out this space while the Pentagon Renovation Program recovered the least damaged spaces in Wedge 1 and Wedge 2 for rapid reoccupancy.

SWING SPACE HIGHLIGHTS

- **910,000 square feet (45 floors) renovated**
- **Over 7,000 personnel moves accomplished**
- **New communications systems installed**
- **Connectivity with the Pentagon maintained**

MILESTONES

The need for swing space will be ongoing throughout the renovation process. The projected completion date for the renovation of the Pentagon is 2010.



Program Manager Lee Evey, (left) checking in with Swing Space tenants.

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Above, excavation work progresses on the General Purpose Switch Room Tunnel, a project essential to the modernization of information and telecommunications in the Pentagon. Below, the existing A-ring steam tunnel has been cleared of all old utilities. The metal racks will be used to shelve conduits for data cable and wiring.



B A S E M E N T / M E Z Z A N I N E SEGMENTS 2-3

Segment 2A1 and Segment 3 of the Pentagon's Basement and Mezzanine levels comprise approximately 500,000 square feet of below ground space. In 2001, the plan to suspend renovation work in the basement other than some portions of Segment 3A, which will be used for the new Physical Fitness and Readiness Facility, was revised to include build-out of approximately 30,000 square feet of space within the basement for permanent general office space for the Navy. The Navy will fund this construction effort. The Pentagon Renovation Program will provide for a new "four spot" electrical vault, in which the Program will initially install two transformers and associated switchgear.

An enhanced universal space plan is being implemented in the basement to facilitate the Congressional directive to accelerate renovation of the Pentagon. This will be flexible space that can be used for a variety of purposes during construction, including control centers, data processing or general office space.

CHALLENGES

Tenants moved into the basement could be adversely affected by construction overhead as renovation work advances around the building.

MILESTONES

Construction started in January 2002 with installation of helical screwed piles that will support a new structural floor slab. The project is to be completed by December 2002.

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Basement/Mezzanine Segments 2-3



Preparing the helical screwed piles.

A worker first cuts out a rectangular area in the floor (1), to mark the area where the screws (2) are to be machine driven (3). The slabs are placed on top of the helical screws.

BASEMENT/MEZZANINE SEGMENT HIGHLIGHTS

- 150,000 square feet of space demolished and abated in preparation for new construction to begin.
- 175 linear feet of tunnel added to communications trenches.
- 1,200 personnel moved into renovated space.
- 30,000 square feet prepared for new construction.

